

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO.: 10/720,579 ART UNIT: 1753

FILED: November 24, 2003 EXAMINER: Wong, E.

TITLE: METHOD FOR MANUFACTURING VERY LOW ROUGHNESS
ELECTRODEPOSITED COPPER FOIL AND ELECTRODEPOSITED COPPER FOIL
MANUFACTURED THEREBY

Amendment A: REMARKS

Upon entry of the present amendments, previous Claims 1 - 15 have been canceled and new Claims 16 - 22 substituted therefor. Reconsideration of the rejections, in light of the forgoing amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of placing the claim language into a more proper U.S. format and also for the purpose of distinguishing the present invention from the prior art.

In the Office Action, it was indicated that Claims 1 - 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Wolski patent in view of the Yates patent and the Merchant patent. Claims 1 - 11 were also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The specification was also objected to because of minor informalities.

In reply to the Official Action, Applicant has extensively amended the original claim language in the form of new Claims 16 - 22. New Claims 16 - 22 express the original limitations found in previous Claims 1 - 12, but express such limitations in a more proper U.S. format, including proper antecedent bases and proper interrelationships throughout. Any indefinite terminology found in the original claim language has been corrected herein.

In particular, new independent Claim 16 reflects the limitations of previous independent Claim 1, along with portions of the limitations found in previous dependent Claims 2 and 3. In particular, new steps have been added in which the initial step is "forming an electrolyte solution". Independent Claim 16 also includes the step of "adding an additive". The formulation of the additive is specified in new independent Claim 16. New independent Claim 16 uses the term "submerging" instead of the term "drowning". New dependent Claim 17 reflects the limitations of previous independent Claim 4. Dependent Claim 18 reflects the limitations of previous dependent Claim 5. New dependent Claims 19 - 22 reflect, respectively, the limitations found in previous dependent Claim 8 - 11. Claim 6 and 7 have been canceled in view of the indefinite recitation and the lack of support in the original specification. The non-elected claims 12 - 15 have been canceled herein. Applicant respectfully contends that the amendments herein serve to distinguish the present invention from the prior art combination.

In the method recited in new independent Claim 16, it is specified that the additive is added. This additive is added to the electrolyte solution and contains between 6ppm to 100ppm of a gelatin, 5ppm to 50ppm of hydroxyethyl cellulose, and 0.05ppm to 20ppm of bis(sodiumsulfopropyl)disulfide. Applicant respectfully contends that none of the prior art references, individually, or in combination, recite an additive that is added to the electrolyte solution in which the additive has this composition. Although the Yates patent does disclose the use of the sulfopropyl disulfide component, the Yates patent lacks the gelatin and the hydroxyethyl cellulose. As such, without this additive, the prior art combination would fail to achieve the advantages of the present invention.

In particular, since the additive that is added to the electrolyte solution contains 0.05ppm to

20ppm of the bis(sodiumsulfopropyl)disulfide, the electrodeposited copper foil can be obtained so as to have a relatively low roughness. This is represented in the original specification in Table 3. In particular, none of the prior art references discloses such a composition nor do they disclose the effect of lowering the roughness of the electrodeposited copper foil. As such, the prior art combination fails to achieve the advantages of the present invention.

Since the prior art references fail to show the composition utilized in the method of manufacturing of the present invention, independent Claim 16 is patentably distinguishable from these prior art references. Additionally, since none of the prior art references specifies the reduction in roughness of the copper foil, the prior art references do not "make obvious" the present invention since the function and advantages of the present invention are not achieved by the compositions of the prior art patents. On this basis, Applicant respectfully contends that independent Claim 16 is patentably distinguishable from the prior art.

Applicant has revised the specification in accordance with the suggestions of the Examiner.

Based upon the foregoing analysis, Applicant contends that independent Claim 16 is now in proper condition for allowance. Additionally, those claims which are dependent upon independent Claim 16 should also be in condition for allowance. Reconsideration of the rejections and allowance of the claims at an early date is earnestly solicited. Since no new claims have been added above those originally paid for, no additional fee is required.

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